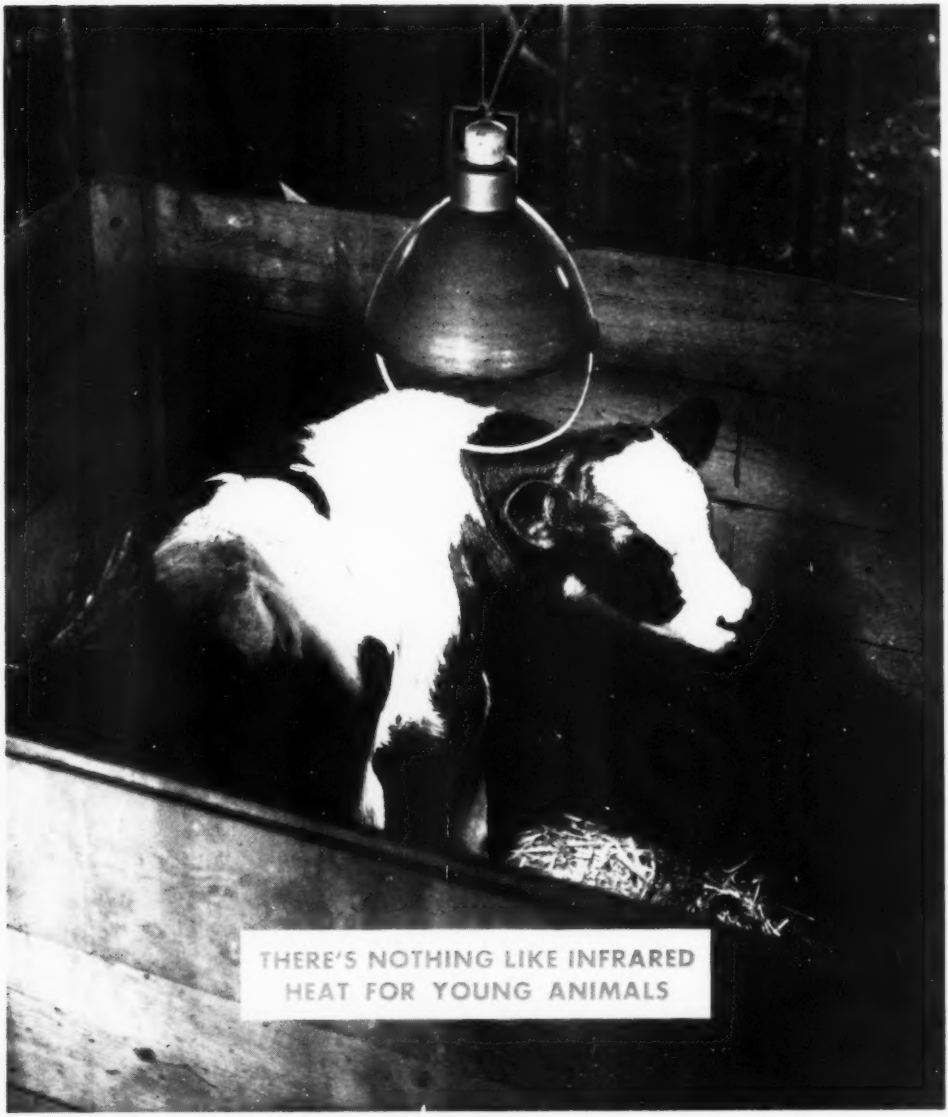
ELECTRICITY ON THE FARM *Magazine*

JANUARY, 1956

Power Washed Dishes Are Cleaner
A Planned Hog Program Pays . . .
All About Electric Motors—Part I
Ventilate For Cow Comfort . . . .

EQUIPMENT BUYING GUIDE—Page 27

BLACKSBURG, VA



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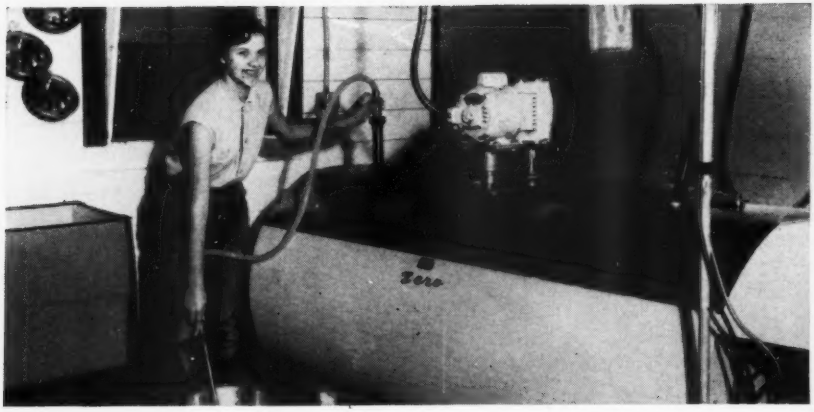

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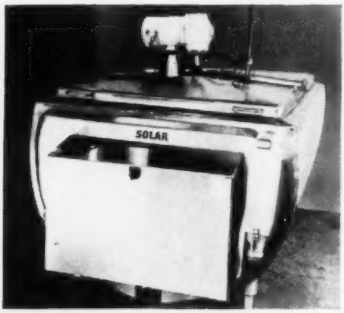

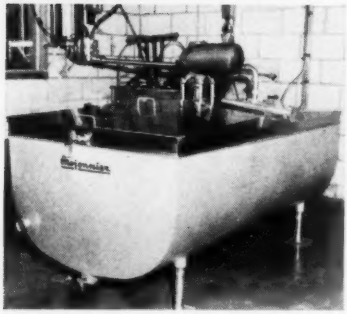

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Editor's Chat

GRIND YOUR OWN GRIST

Some of us can remember those good old days when a fellow could take off in the morning with a load of grist to be ground and spend a pleasant day with his fellow farmers at the mill and not come home till after the women and kids had all the chores done. Even a trip to the blacksmith shop could be stretched into a fair day's vacation. But those days are no more. Now you whisk to mill in the truck and if you're not back in time for dinner you have to answer embarrassing questions.

However, if one does have grist to grind and handle, it is very easy to rig electric motors, elevators, blowers, hammer mills and such so the job can be done with a minimum of labor and expense. And if the farmer's whereabouts and behavior are subject to inspection and report, he may sit in the kitchen and read ELECTRICITY ON THE FARM and smell good things cooking while automatic grinding works up his grains into good, home-grown feed.

LAMP LIGHT AND HEAT

Barring the season when it is too warm everywhere, there is nothing which brings more cheer and comfort than light and heat. When both are combined into an economical, portable, electric lamp called a "heat lamp," one has about as much comfort and cheer in one small package as it is possible to imagine. We see more and more of them in use as we travel around. And baby chickens, pigs, lambs and calves, not to mention the man working at the sink or bench or packing eggs, all seem to like this combination of light and heat.

Infrared lamps come in various styles and sizes to fit a wide variety of applications. If you feel the need of a bit of comfort for yourself where you work, or for your young stock or baby chicks, just keep in mind this convenient, economical combination of two of the greatest blessings this life affords—light and heat—a "heat lamp."

WHATEVER GOES UP HAS TO COME DOWN

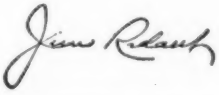
We don't know whether that old saying originated when Mr. Newton discovered the law of gravity or when the first farmer to have a silo had to go up and pitch down silage on a cold, winter morning. However, be that as it may, far too many farmers who have the job of getting silage up into the silo pretty well licked, still climb a ladder twice a day and hack it loose and pitch it down the hard way —by hand.

Aside from the risks and labor involved, getting silage out with a mechanical silo unloader seems to improve the palatability or edibility by breaking it up and mixing it. Whether this increases feeding value enough to pay interest on the investment, only a cow can tell. But we do know that more and more silo unloaders are being used and the men who have them seem to be well satisfied with the change. All sorts of changes come and this is a good one for the man with a tall silo in a cold climate and even a cow can see the truth in that.

A HAPPY AND PROSPEROUS NEW YEAR

In wishing you a Happy New Year, we sincerely hope this magazine will contribute to your health, wealth and happiness throughout the coming months. If so, our main purpose will be accomplished. There will doubtless be many applications of electricity presented that have no possible relation to your way of life. But we are all interested in what the other fellow is doing, or they would never have invented windows, newspapers, binoculars and periscopes. Too many of us spend too much time looking into a mirror instead of through a window. We will try to act as a window through which you may see some of the more interesting items of progress in farm and home electrification going on all about you.

We hope that what you see and do contributes to your health, wealth and joy of living.



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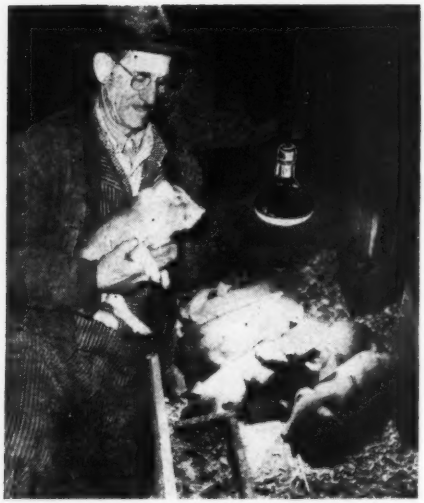


A Planned Hog Program Pays

Equipment, Management, Nutrition and Marketing Important Factors

By HERBERT JONAS

Farrow sows in January and June—put electricity to work to save on costs and to help hurry along gains—have pigs ready for market when pork supplies are light and prices are up.

These are the basic rules F. P. Rodman follows to make extra dollars from the 1,000 head of hogs he sells each year from his Yakima Valley farm enterprise. Following this basic rule over a period of 15 years has enabled Rodman to expand his farm holdings from a small 10-acre place to ownership of a 78-acre diversified farm and a 27-acre fruit orchard.

"We farrow early and feed heavily, figure on getting 200 pound hogs in 5½ months. This puts our January pigs on the June and July market, and puts our June pigs on the January and February market—just before and just after the heavy influx of fall marketed pigs," says Rodman.

Uses Electricity

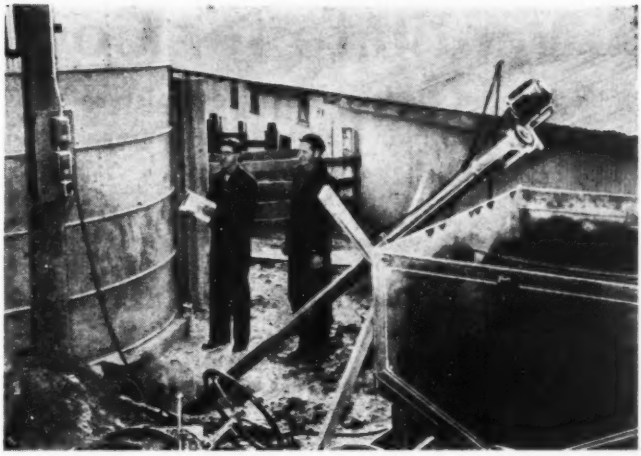
Here are ways this successful Yakima Valley farmer puts electricity to work to get bigger returns from hog raising:

- He uses infrared lamps to avoid cold weather farrowing losses and give young pigs a better start.
- He uses electric lights in hog houses and feed lots to keep animals active and feeding day and night.
- He puts electric water warmers in stock water tanks during winter months – boosts gains by 10% during this period by inducing hogs to increase their cold weather intake and eat more feed.
- He uses sprinkler irrigated pastures to reduce grain requirements for hogs during the grazing season—also uses these pastures to hold hogs at market weight while awaiting a favorable price development.
- He has water piped under pressure from a 40 ft. well by a ¾-hp. electric pump to the farrowing house, feed lots, hog houses and pastures. He also has his own grain grinding and conveying system which he uses with an auger feed cart to supply self-feeders in the hog yards. He says these uses of electricity, alone, do the work of an extra hired man.

The Rodman farm has a 128 ft. by 30 ft. farrowing house which contains 32 farrowing pens. Each pen is outfitted with a heat lamp brooder for winter use and a farrowing crate for summer use. This arrangement helps reduce baby pig mortality to about 1%.

"Our baby pigs start on pro-

Night lighting in the hog house and feed lot keeps growing animals active and eating, resulting in faster gains.



A time switch control is used on the hammermill and auger conveyor so the feed cart can be filled unattended.

tein pellets when they're three days to a week old," Rodman points out. "We figure they'll make one pound of gain for each 1½ pounds of pellets we feed, will weigh 45 pounds and be ready to wean at six weeks.

"Feeding these protein supplement pellets helps eliminate scours, guards against runts, and brings a good return on the price of the pellets. At 1955 prices, when pellets were $160 a ton and hogs were worth $18 a hundredweight, we got 12¢ worth of gain for every 8¢ worth of pellets we fed."

Rodman continues to pour feed to his animals after weaning. Hog houses and yards are lighted at night to keep growing pigs active and eating. Shoats start on a ration of 1500 pounds of barley and 500 pounds of protein supplement. At 60 pounds weight, the animals get 1600 pounds of barley and 400 pounds of supplement. When the pigs reach 125 pounds weight, the ration is adjusted to 1700 pounds of barley with 300 pounds of supplement. This feeding schedule is aimed at bringing hogs up to 200 pounds market weight at 5½ months.

Rodman feeds heavily, but he economizes wherever he can on grain expense. He puts great stress on irrigated pasture. And, he shops around at harvest time to save $5 to $8 per ton on the 150 tons of barley he stores in his granery. He makes further savings by grinding and mixing feed on the farm.

After studying and experimenting with pasture mixtures for several years, Rodman has concluded that best results are obtained with straight alfalfa pasture. He cross-fences pastures with electric fencing for easy rotation. He relies on electric pumping and sprinkler irrigation to get quick recovery of pasture plants after grazing.

"Pasture management is important to making money out of hogs," stresses Rodman. "We cut our grain bill 20% by pasturing during grazing season, and we can hold hogs at market weight on pasture two to four weeks while awaiting a favorable price."

Recommendations

Here are more of Rodman's recommendations:

Choose good stock. Only healthy sows have healthy, strong pigs that grow into top price hogs.

Strive for big litters. Mating is important. If a sow is mated a day early or a day late, she will have fewer pigs.

Keep hogs clean. Rodman uses an electric sprayer to spray for flies once each 21 days during fly season. He keeps pens so clean, there is no odor and no need for vaccinating. He never feeds garbage, won't allow wallows or mud holes—says these are dangerous carriers of disease.

Keep hogs cool. Rodman has aluminum roofs to reflect heat from his buildings. He has garden hoses from pressure water system connections to afford overhead sprinklers for hogs during hot weather.

"Take care of your hogs, farrow sows early, get hogs up to market weight as soon as you can, get them sold, and get the money in the bank," counsels this successful hog raiser.

Sprinkler irrigated pasture is a big factor in Rodman's successful hog raising program.

Ventilate for Cow Comfort

Engineered Systems Remove Moisture and Odors, Provide Fresh Air, Maintain Controlled Temperatures—All Automatically

By BRUCE FEARN

Sweating windows, dripping walls and stale, heavy air contribute nothing toward the health of a dairy herd. In fact such conditions in a dairy stable make no worthwhile contribution anywhere. Dampness in a stable will rust out metal window frames or rot wooden ones. Black mold forms on painted woodwork. Structural timbers rot at the joints and cause unnecessary depreciation and expensive repairs. A farmer has pride too. He likes to work in bright clean surroundings. But if his stable is damp, this is an uphill fight. As soon as he cleans windows or paints, the relentless dampness upsets things.

Engineered ventilation systems using electric fans can remove moisture and odors, provide fresh air, and maintain controlled temperatures without drafts—all automatically. This engineered system can be planned by power supplier farm service men, state extension people, county agents, and some vocational agricultural teachers.

A good illustration of what can be done with an electric fan in a dairy stable is the stable at the George School, Newtown, Penna. There is a complete dairy farm on the grounds at George School. The dairy stable is not new but it is a good stable. It has plenty of windows. It is reasonably convenient and with its 37 comfort stalls and 8 box stalls the cattle are comfortable. Generally speaking, it could be said that Lamartine Hood, the farm manager, was satisfied with the cow stable. However, there was one exception. The stable was damp and an abundance of condensation was evident.

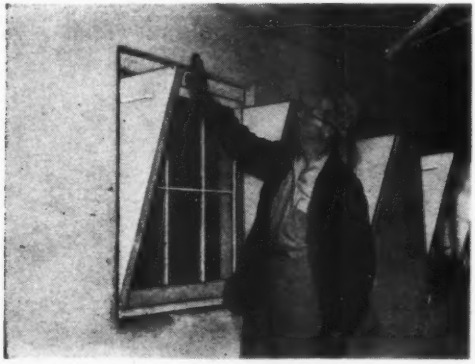
Hood called on his county agent for help in planning an engineered system. Many factors enter into a stable ventilation job so the county agent took them each in turn. One important factor is the amount of animal weight being housed. In this instance there were 37 Holsteins averaging 1200 lbs. apiece, or about 44 animal units at 1000 lbs. each. In addition, the young stock in the box stalls would add another 3 animal units at 1000 lbs. each making a total unit population of 47. Now, in southeastern Pennsylvania, many authorities recommend that upwards to 200 cubic feet of air per minute (cfm) be removed from the stable for each 1000 lbs. of animals housed. Considering the available openings (it is often not feasible to knock out a stone wall to house a fan) a 30-inch belted fan was the best choice. The fan chosen delivered just shy of 9000 cfm at the required ⅛th inch static pressure. This was close enough to the 200 figure to do the trick.

The next decision was the fan location. It was finally decided to put the fan in the top of an old, unused doorway at the end of the stable where the box stalls are located and the young stock is housed. In this location the warm air from the adult animals would be drawn to the box stalls and thereby make that area warmer.

Next came the selection of controls. Various devices were considered, but an ordinary air thermostat was chosen. It was decided to place it toward the area of the young stock and between the two rows of comfort stalls. It was mounted about 7 ft. from the floor and set at 50°F.

Last, but not least, air intakes were considered. Though some natural infiltration existed around the doors and windows the stable at George School, compared to most old barns, was a snug structure. Discussion centered around

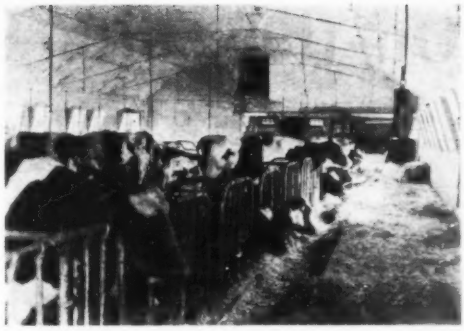
This ventilation system called for a 30-inch fan belted to an electric motor. Automatic louvers are used on the outside and a wire mesh screen covers the inside for protection.



Windows are titled in or "cracked" ¼-inch at the top to provide air intakes. With all windows so adjusted, an ample amount of air enters without causing any drafts.

the solid row of tilt-in window that ran the full length of each side of the stable. To open some of the tilt-in windows and leave others closed made drafts possible and no one, especially Hood, wanted any drafts. At last, after much consideration, every tilt-in window was "cracked" open ¼ inch and fastened there. The idea here was, in effect, to let the stable breathe. No opening was big enough to permit a draft but all the "cracked" windows together allowed a lot of air to come in. The figures said there would be enough to satisfy the requirements of the fan.

The job works well. Before, the windows would run with condensation; now they are dry. The walls that used to be damp are also dry. The air has a clean, fresh smell. The cows seem to be more satisfied too. When not eating they spend most of their time lying down chewing their cuds. They appear comfortable. Hood likes the ventilated stable too. He says, "Every dairy stable should have a good ventilation system. It pays off in peace of mind. I can go to bed now and know that my animals are safe for the night."



A general view of the George School dairy stable. Windows on each side are "cracked" ¼-inch at the top. The fan is located at the far end of the barn.

Plastic Hover Conserves Heat

This new plastic hover that fits over a regular infrared brooder really fills the bill for raising broilers. It's the best brooder I've seen yet." That's how Bill Boyd, Etowah county, Alabama farmer-poultryman, described the six "magic mother" infrared brooders that he's using in connection with his operation.

A couple of years ago Bill graduated from high school and started farming for himself on a 150 acres that he purchased some four miles east of Gadsden. He began his farming operation with thirty registered heifer cows bought from profits gained through his 4-H Club work in beef production. Within a few months he began looking around for another livestock enterprise which would fit in with his beef cattle program and would better utilize the available labor on his farm. Poultry seemed to be the answer as he already had three buildings on the place that could be converted to broiler houses.

In the early summer of 1954, Bill placed 4,500 broilers in two of the houses. Some nine weeks later the birds were sold for 21½c a pound and he made money. He saved the fertilizer from the broilers and put it on his pastures. As a result, Bill was one of the few farmers in his section who had good pastures through the winter of 1954 and 1955. With this experience he increased his broiler production and last March added another 3,500 birds in the third house. This gave him a total of 8,000 broilers.

E. E. Shelton, Rural Service Engineer with Boyd's power supplier, had been talking with Bill about the possibility of using electricity in connection with his brooding operation and Bill decided to install six "magic mother" infrared brooders in the third house. Each brooder was equipped with a plastic hover for conserving heat. The brooders have four 250-watt infrared heat lamps each, thermostatically controlled by a wafer capable of dimming all four lamps to reduce the heat as necessary. The plastic hover holds the heat where it's needed and distributes it evenly over the brooder, still allowing the operator to see the chicks at all times.

During the first week the chicks were placed under the brooders, the temperature dropped to 18 degrees above, and the chicks were very comfortable without any type of supplementary heat. The operating cost for these chicks which were placed in the brooder house the last week in March, was .57/100 cents per chick. This included both lights and brooding. Bill likes this type of brooder so well that he plans to discard his brooders in his other two houses in the near future and add infrared brooders with plastic hovers.

GENE SHELTON

Bill Boyd discussing his plastic hover type chick brooder with Gene Shelton. The plastic unit fits directly over a conventional infrared brooder unit. Boyd says the hover holds and distributes heat. At the same time the operator can view the chicks.

On-the-Farm Grain Processing

Mixer Grinder Unit Makes Feed Preparation An Automatic Operation

By RALPH BOWEN

What does automatic grain processing mean to the farmer who has been accustomed to spending at least one-half day each two weeks at the familiar job of grinding feed?

Stemper's installation is a very simple one, yet very practical. The 2 hp mixer grinder is located in the barn feed alley. Pipes from four overhead bins feed ingredients into hopper in proportions as set by dials.

One farmer who has installed an automatic mixing and grinding unit says, "We don't grind feed any more." When asked, "Why don't you grind feed any more?", they reply, "This is an automatic operation. We only see that the storage bins are kept full. The feed cart is put into place after each feeding. We set the timer. The mixer grinder unit does the rest of the job without attention. The correct proportions of all the grains and concentrates are measured out and mixed as they are fed into the mill for grinding. The mill does all this automatically and stops at the predetermined time, usually about 13 minutes for my herd."

The mill which Allen Stemper of Plymouth, Wisconsin, installed is placed on a box at one end of the feed alley. Some of the grain bins were over this unit so all Stemper did was to put some partitions above the mill so that he now has four bins; two are large and two are small. Each of the larger bins hold about fifty bushels of material. These are filled with shelled corn and oats. The two smaller bins hold about twenty bushels each and these smaller bins are filled with concentrates and minerals. The bins are alongside the driveway on the upper barn floor so the concentrates and minerals can be unloaded directly from the truck to storage when they are brought from the mill.

This unit uses a 2 hp motor and the wiring cost was very little—about 12 ft. of non-metallic wire and a small switch box were the only materials needed.

Stemper and his son demonstrate one phase of huge chore they used to have in getting grain to mill for grinding before installing their mixer grinder.

A test on the grinding unit for the month of March shows the following:

44 cows were fed.

25-40 were cows being milked. (Month started with 25 and ended with 40.)

42,000 lbs. milk produced.

9,540 pounds of ration measured, mixed and ground.
(3 parts high protein concentrate.
(1 part mineral.
(15 parts shelled corn.
(25 parts oats.
(Ground through ¾ inch screen.

13 minutes average grinding time per feeding.

22 KWHr used in 31 days.

Stemper is very well pleased with this mixing and grinding operation. He and his son tell us the old method consisted of the job of filling grain bags with grain, loading them on the truck, taking them to the mill, unloading them on the platform, waiting for the grain to be ground and mixed, reloading the bags on the truck, and hauling them back home. They were then unloaded into the feed room. When the ground feed was to be used, it was lifted and dumped into the feed cart where it was wheeled to the cows and finally measured out at each location. By watching farmers prepare grain to take to the mill, we can see that the job of grinding feed is not the big part. It is the measuring, bagging and lifting that really adds up to a disagreeable chore, especially when one considers that job has to be accomplished in dust and dirt, and often in the winter the trip to the mill is not a pleasant one. All very good reasons why the Allen Stemper family doesn't grind feed any more!

Advertisement

WORK-FREE FEEDING Here's the machine that makes it possible . . . the Clay Mechanical Feeder. And the man responsible for this labor saver has answered the questions most farmers ask about feeding mechanically. Is your question here?

An expert answers your questions about

Mechanical Feeding

By JOE CLAY

Mechanical Feeders, the wonderful machine that feeds cows automatically without hauling pitching or handling feed, are still so new that dairymen want specific answers to certain questions *before* they invest. Here are some questions I hear often, and the answers I give:

How long will it take to fill a 50' bunk to feed 35 to 40 head?

Roughly 15 minutes, but this depends on how fast your silo unloader delivers silage to the auger, and whether you feed a light or heavy amount of silage.

What kinds of feed will the mechanical feeder handle?

All kinds of silage, chopped hay or straight grain feed.

Will it mix grain and silage so animals won't pick out tasty feed and leave roughage?

It mixes thoroughly, better than you ever could by hand.

Is this practical for a dairyman with only 15 to 20 cows?

Definitely! It's good management to let cows out every day to exercise and besides the cost is low.

How much power to operate?

Roughly about 2 to 4 cents per day.

Are special bunks necessary?

No. Use old bunks 42" or wider.

My silo chute faces the barn, how do I handle that problem?

Your silo unloader pours silage into the auger and the outside feeder can curve as much as 90 degrees into the yard.

What if the feeder blocks access to the silo for filling?

It's simple to take out sections if you plan for it at installation.

How about a mechanical feeder in a loose stock shed?

Location of your present loafing barn, silo and grain supply is a problem to be worked out individually. Send me a sketch of your layout and I'll give you my suggestions.

MECHANICAL FEEDER BULLETIN

Mr. Clay's free bulletin for dairy farmers on mechanical feeding will be sent on request. The address is 168 Pearl St., Cedar Falls, Iowa. Booklets on Silo Unloaders, Barn Cleaners, Crop Driers and Milking Parlor Stalls also available. (Please specify booklets wanted.)

SILO UNLOADER—by Clay Equipment Corp. Ideal companion to the Clay Mechanical Feeder. Unloads silo automatically . . . right into the feeder. The perfect pair for easier farming.

Electric Heater for Comfort

Handling, cleaning and packing eggs is a "stand in one spot" job. In the winter time, in a cold egg room, such a job often results in cold feet and less efficiency. There is an old saying that "When the feet are cold you are cold all over". Never is that more true than when handling eggs.

An inexpensive answer to the problem is a portable, fan type heater placed to spot heat the feet and legs.

The space heater with built-in circulating fan is placed just a few feet from the working area. Warm air is blown past worker's feet providing comfort and warmth for him as he performs his duties.

The job can be done with small expense. A 115 volt heater for plug in use on a standard electric outlet is large enough. These can be bought for about $20.00. Such a heater operated 2 hours a day, 30 days a month, would use about 80 KWHr per month. That is only a few pennies a day and farmers who use this say they get a heap of comfort at little cost.

When lights in the dairy barn flicker in time with pulsations of the milking machine, changes should be made in the electric wiring, says a University of Tennessee engineer.

All About Electric Motors—Part I

Selecting an Electric Motor for Farm Application According to Type and Size

EDITOR'S NOTE: *Appearing on this page is the first of a series of five articles on ELECTRIC MOTORS. This series will present the most significant and useful information on farm motor application. Subsequent articles will cover "Choosing an Electric Motor According to Special Features" in February; "Controls and Overload Protection for Electric Motors" in March; "Installation of Electric Motors" in April; and "Maintenance of Electric Motors" in May.*

We feel that every one of these articles will be of special interest to you.

By **ROBERT H. BROWN**

In order to make the proper choice of motor it is necessary to understand what a motor does.

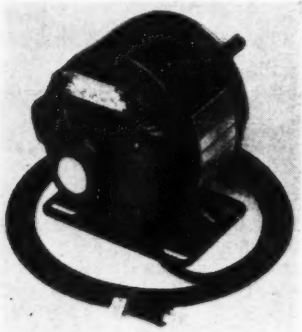


Fig. 1. Split-phase motors are designed for easy starting loads. They are generally available in only the smaller sizes—1/20 to ⅓ hp.

The motor must do three things:

1. It must start the load (equipment)
2. It must drive the load after it is started
3. It must be able to withstand the "abuse" of its surroundings

Some equipment such as a small grinder and a seed grader are easy to start but a refrigeration compressor and a deep well pump are hard to start. The starting requirements vary due to the type of operation performed by the equipment or to the size of the equipment or both. Regardless of why the starting needs vary it is understandable that the starting job does depend on the equipment. A good way to associate the idea of various starting needs is to remember how one operates a tractor: low gear for very difficult loads, second gear for fairly difficult loads and high gear for starting off with easy loads.

Choosing Motor Type

Electric motors for the farm (single-phase motors) may be any one of several types. The motor is not inherently self-starting and manufacturers have to incorporate certain electrical features along with the basic motor in order for it to develop the turning effort necessary for starting. The several motor types start for different electrical reasons therefore it is logical that they do not have the same ability to start an attached load. The motors are named after the principle use to make them self-starting and **the name of a motor identifies its starting ability.** For farm use the names and starting characteristics are given in Table 1 and the motors are shown in Figures 1, 2, and 3. Following the information given in this table one selects a "name" in choosing a motor that can do job No. 1, namely: "start the load." For example if the application is driving a small bench grinder (easy to start),—select a split phase motor.

To assist in the selection where there may be some doubt it is usually necessary to consider a few more details about these motors. All types are available from the larger electrical stores but hardware stores and smaller electrical shops may stock only the split-phase and the capacitor-start. The split-phase is the least expensive. There is very little difference in the price of the others. If the wires supplying electricity to the motor are quite long (200 ft), the repulsion start

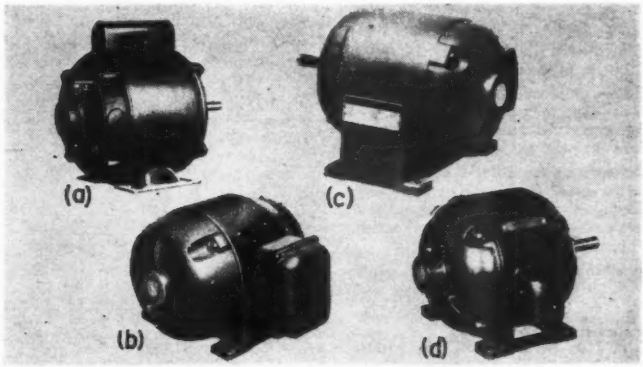


Fig. 2. The above motors are designed for more difficult starting loads. Motors (a), (b), and (c) are single-phase, capacitor start motors. The capacitor on (a) is located on top of motor; for (b) it is on the side; and for (c) it is inside the end shield. Motor (d) is a three-phase, general purpose motor for use only where three-phase power is available.

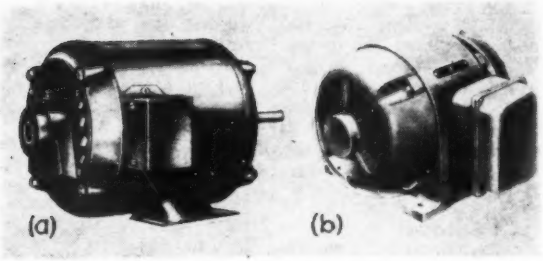


Fig. 3. The repulsion start motor (a) and capacitor start—capacitor run motor (b) are single-phase motors for difficult starting loads.

is a first choice since it gives the greatest starting effort with a minimum of starting current, the split-phase motor is a last choice since it requires the most starting current. For general purpose use on jobs requiring a small size motor the capacitor-start is the best choice and for general purpose use on larger (over 2 hp) jobs the two-value capacitor motor is probably the best choice. The speed of all these motors is practically constant and their operation is similar except that the repulsion-start motor may cause some radio and TV interference. The two-value capacitor type motor is suggested in lieu of the capacitor-start for sizes over 1½ hp. Additional factors which influence a selection of "type motor" are discussed in the following paragraphs.

Determining Size

Having decided upon a motor that will be capable of starting the load, the next decision is to provide a motor that will do job No. 2, namely "drive the load after it has been started." **The answer to the first decision was a "name"** such as capacitor-start but **the answer to the second job will be a number** such as ¾ or 5.

The question now is **"what hp size is needed?,** and the answer must come from these standard sizes: 1/6, 1/4, 1/3, 1/2, 3/4, 1, 1-1/2, 2, 3, 5, 7-1/2, and 10. This listing is subject to certain limitations. If a split-phase motor has been selected the choice of hp is 1/6, 1/4 or 1/3 for due to its weak starting ability it is not manufactured in the larger sizes. In addition it is not good practice to select a motor larger than 1/2 hp when the motor must operate from a 115-volt source. Therefore if the farm does not have 3-wire service (115 and 230 volts) the choice is again limited to 1/6, 1/4, or 1/3. A final limitation comes from the power supplier. So far it has not been economically feasible for the average power supplier to provide adequate electrical capacity for serving motors larger than 7½ hp. This limitation exists for a combination of reasons, and the range may eventually be extended. But, at the present time the main thing is to recognize

TABLE 1. Motor Names and Ability to Start a Load

Name of Motor	Used for	Motor's Starting Ability	Amount of Electricity Required to Start Motor (Surge Current)
Split-phase	Easy Starting loads	2½ times normal	Large amount
Capacitor-start	Difficult Starting loads	3½ times normal	Medium amount
Repulsion-start	Very Difficult Starting loads (Med. size)	4½ times normal	Low amount
Two-value Capacitor (Capacitor-Start Capacitor-Run)	Very Difficult Starting loads (Large size)	3 times normal	Medium amount

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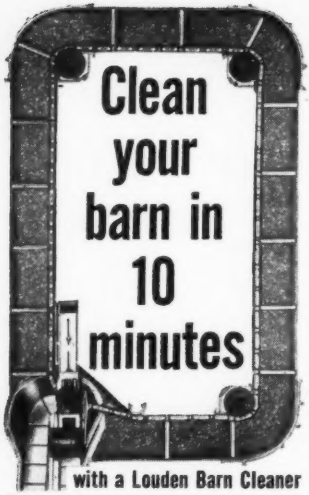

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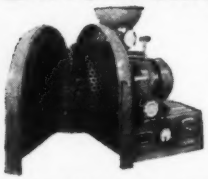

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MOORHEAD, MINN.

that it does exist and to accept the fact that it is an electrical circumstance which the power supplier can not help.

The selection of hp size can be made by any one of the following methods. Method 1 is most reliable, method 2 next, etc.

Method 1. Write the manufacturer of the equipment to be driven. Ask him to supply the motor or to send you the specifications for the motor best suited to the equipment. The manufacturer is most familiar with the operation of his equipment and no doubt has the best available data on motor requirements. Furnish the manufacturer with a complete description of the job and when in doubt it is usually best to copy all of the nameplate data from the equipment so that the reader can readily identify the particular product.

Method 2. Refer to Table 2 and select the motor size from these tables. One very important factor in using the tables is to make absolutely certain that the operating speed of the equipment and the proposed capacity of the equipment is within the range listed in the table. If the speed is to be different from that shown do not depend upon the listed hp size. The higher the speed, the greater is the hp requirement, and if the capacity is greater than the listed values a larger motor is needed.

Method 3. Certain "rules of thumb" often provide a quick dependable answer. There are two rules which experience has upheld as satisfactory.

1. If the machine or equipment has previously been operated by hand and if the speed is to remain unchanged from the hand-operated value then a ¼-hp electric motor is the size.

2. If the machine or equipment has previously been driven by a gasoline engine and if the speed is to remain unchanged then select a motor having a hp rating of 2/3 that of the gasoline engine.

Acknowledgement

All tables and illustrations used in this article are from the publication *Selecting Farm Electric Motors, Controls, and Drives* issued by the Southern Association of Agricultural Engineers and Vocational Agriculture, Barrow Hall, Athens, Georgia.

TABLE 2. Motor Sizes for Operating Various Farm Machines

CONCRETE MIXER

Size Cubic Ft.	Speed (rpm)	Motor Size (hp)
3½	120-160	⅓
4	on	½
5	pulley shaft	½

DRILL PRESS

Maximum Drill Size (in.)	Speed Range (rpm)	Motor Size (hp)
⅜	1150-3450	¼
½	750-4000	½
½	500-5000	½

SAWS
(Circular, rip and crosscut)

Size (inches)	Oper. Speed (rpm)	Motor Size (hp)
8	3800-4500	½-¾
9	3600-4200	½-¾
10	3450-4000	¾-1
12	3200-4000	3

WAGON UNLOADER
(Capacity 1 to 2 tons)

Length Wagon (ft.)	Approx. Conveyor Speed (ft. per min.)	Motor Size (hp)
8-12	(1½ to 2)	⅓
14-16		½

FEED MIXERS

Size and Approximate Capacity (lbs. per batch)	Operating Speed (rpm of pulley)	Motor Size (hp)
500	(200-400	1
700	depending	1½
1000	on make	2
1200	of mixer)	3
2000		5
3000		7½

HAY HOISTS
(Rope speed 100-130 ft. per min.)

Approx. Weight to be lifted (lbs.)	Pulley Speed (rpm)	Motor Size (hp)
300	(100-300	1
*600	varies	2
900	with make	3
1200-1500	of hoist)	5

*Average pull for loose hay

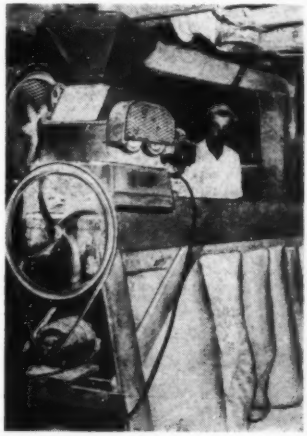
ROLLER TYPE (Crimper Crusher)

Approx. Capacity (lbs. per hour)	Operating Speed (rpm)	Motor Size (hp)
150-190	(250 to 600)	¼
450-850		1
700-2200		2
1200-3000		3
1800-7500		5
3500-12,000		7½

Once upon a time there was a college freshman who flunked in geology. He tried to explain it to his mother and father. "I guess," said he, "I took everything for GRANITE." . . . . RIDDLE DEPT.: What did the ballpoint pen say to the paper? ANSWER: "I DOT my EYE on YOU." (Caw! Caw!) . . . . INCOME TAX FORMS: Blankety Blanks . . . . SODDEN THOUGHT: TOO many critics are SNEER-SIGHTED . . . . ENGAGEMENT RING: One man BAND . . . . OVERHEARD: "We'd make a LOVELY COUPLE if it WEREN'T for YOU!" . . . . VICIOUS CIRCLE: Rags make paper. Paper makes money. Money makes banks. Banks make loans. Loans make poverty. Poverty makes rags. And THERE you are! . . . . Limerick Dept.: "A major, with wonderful force, Called out in Hyde Park for a HORSE. All the flowers looked round, But NO horse could be found; So he just RHODODENDRON, of course." . . . . "What do you have there?" "A clamp." "Oh, so you're a VISE guy." . . . . "What are the names of the bones in your hand?" the prof asked a student in his medical class. "DICE!" replied the stude, as he suddenly came to life . . . . POULTRY RAISING: EGGriculture . . . FARMING as a HOBBY: AgRICHculture . . . EFFICIENT FARMING: AgriCULLture . . . HORSE RAISING: AgriCOLTure . . . LIVESTOCK FARMING: AgriculCHORE . . . (Hudson Newsletter) . . . . WEDDING RING: War HOOP . . . . MANY a man thinks he's GOING places when he's ALREADY been TAKEN . . . . SIGN in a Minneapolis restaurant: "T-BONE, 25c, WITH MEAT, $4.00." . . . . DIET: Something BETWEEN what the Doctor TOLD you to eat and WHAT your wife WANTS to give you . . . . Sure 'tis unfortunate that DEATH and TAXES do not come in THAT order . . . . If you give SOME women enough rope—they'll RIG UP another clothesline in the bathroom . . . . EVERSTOPTOTHINK? — TOO many times a PENNY SAVED is a POCKET BURNED . . . . JINGLEJOLLY DEPT.: "Last night I sat upon a chair, A little chair that WASN'T there; It WASN'T there again today—But I can't sit down anyway." . . . . Your pun-peddler—DUFFY.

Power Feed Sacker

A ¾ hp electric motor and an auger-conveyor trough make it possible for Thomas Snodgrass, Street, Maryland to bag 9 sacks of feed at a time as it comes from his mill. The grain feeds into the electrically-powered (3 hp motor) mill from an overhead bin. As the ground feed falls out of the discharge opening of the mill it drops into the conveyor trough. It is moved along down



Nine sacks are attached under the conveyor trough—one sack under each port hole. The system will grind and fill all nine sacks without further attention from the operator.

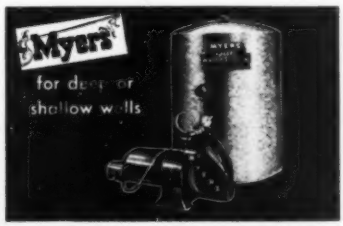
the trough by an auger driven by the second electric motor (the ¾ hp motor) shown in the foreground.

There are nine holes in the bottom of the conveyor trough, one directly over each sack. The ground feed is moved down the trough until it comes to the first hole and then falls into the first sack. After the first sack is filled the feed moves to the second; then the third; the fourth; and so on. Although the sacks are completely filled when taken off the trough a few light bounces on the floor settles the feed enough to allow tying of the bags. Simple, isn't it?

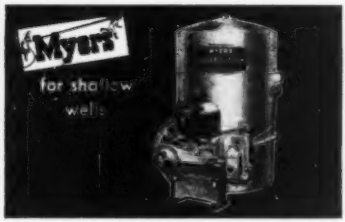
For convenience, electric outlets for appliances should be placed about 40 inches high at each working area.

For carefree water service

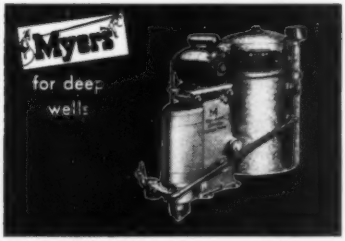
Select a quality MYERS pump



Myers "HN" Ejecto—"City main" efficiency for home or farm. Only one moving part assures years of quiet dependability. Lifetime lubrication for attention-free performance.



Myers 1909 AT—Completely self-oiling plunger-type pump. Economical, ideal for homes with average pressure and capacity requirements. Completely automatic.



Myers V2950 AMT—For top efficiency at extreme well depths. Features Myers double-gear construction for long, trouble-free life.

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Power Washed Dishes are Cleaner

Ohio Tests Prove Dishwashers are Not Luxuries

Naomi, daughter of Mr. and Mrs. W. A. Antill of Angleton, Texas, gives her mother a hand with their electric dishwasher. They find it very convenient for washing and scalding freezer jars used in packaging foods for their electric food freezer. "It is such a time saver!" explains Mrs. Antill. "No longer do I dread Sunday dishwashing with all the company we have. During the week it is not necessary to run the dishwasher after each meal—just rinse and load after each meal—then one run does all the dishes for the day." Often during the summer months the Antills eat their meals or snacks out of doors. If by chance the soiled dishes are exposed to flies or animals before they are returned to the kitchen, Mrs. Antill doesn't worry. Her electric dishwasher completely sterilizes the dishes.

I must get busy and do these dishes." "Mary, come here and get these dishes done." How many times have you wished for some bit of magic to do the dishes or had to use persuasive powers to get a son or daughter busy on their task?

You can have that bit of magic and pleasant after dinner relaxation simply by the addition of a dishwasher to your list of electrical servants.

Recent studies conducted by the Ohio Experiment Station showed that this appliance is not the luxury item it is often considered. These investigations were made by homemakers who were doing dishes manually. They continued on with the manual operation for 30 days and then dishwashers were installed and these were used for 30 days. Results showed that 4/5 of the time spent in manually washing dishes could be saved with the use of a dishwasher. On the average, dishwashers were used only twice a day. Breakfast and lunch dishes were done together, dinner dishes washed separately.

The cost of installation varied depending on plumbing conditions and labor costs. And the amount of water used varied from only a little more for a homemaker who had used as much as eight gallons per washing by hand to three times as much for those who used little for handwashing. Detergent costs varied little.

Dishes washed in the dishwasher showed much less bacterial count, indicating they were more sanitary. Water enters the dishwasher much hotter than the hands can stand, leaving china, silverware, glassware, and cooking utensils hygienically clean.

. . . . . (More on page 19)

While serving as President of the district Federation of Women's Clubs, it would not be unusual to see Mrs. Robert Farmer in this pose. With the aid of her electric dishwasher, she did not have to delay dressing until after completion of her kitchen routine. Mrs. Farmer is very active in civic and social affairs in West Columbia, Texas. She appreciates the many hours her dishwasher saves in her full daily schedule of housework.

Left to right, Karen Jo, Sandra, and Bonnie Jean Churchill prepare their favorite dinner of pancakes and sausages with their mother's electric frypan.

Ann Berry of Solomon, Kansas, likes her frypan because she can prepare meals at the table. Here she dishes up browned pork chop—one of her favorites.

The Electric Frypan is Versatile

Homemakers Find It Performs Numerous Cooking Services; Portability Feature Means Even More Convenience

Were you one of the lucky people who received an electric frypan for Christmas? Mrs. Burdette Churchill of Rock County, Wisconsin was one of these persons. She finds that she is not the only one in her family to make use of this versatile piece of equipment. Her three daughters Sandra, 13, Bonnie Jean, 11, and Karen Jo, 8, enjoy preparing meals with it too. Their favorite meal is pancakes and sausages, which they are always willing to prepare when mother is busy sewing or doing other jobs around the house. Sandra does the mixing with the electric mixer while Bonnie Jean and Karen set the table, and make the salad and dessert. Then they all have a hand in frying.

When the frypan is not being used for the main course it turns out a delicately flavored pineapple upside down cake. The cake is pretty as a picture and large enough to provide generous servings for all to enjoy. Just melt a quarter cup of butter in the bottom of the pan and add a cup of brown sugar. Place pineapple rings on this and top with prepared cake mix.

A popular main dish meal for the Churchills is a beef pot roast complete with potatoes, carrots, onions, and a bay leaf for flavoring. Just the addition of water after the meat is browned and the setting of controls to low temperature is the assurance of a tasty well cooked roast. The vegetables are added 30 to 45 minutes before the meat will be done. This or any other one-dish meal may be prepared and left to cook by itself.

With this modern appliance you can fry, braise, stew, bake, and even cook casserole dishes. What is more, it can be done anywhere that it is convenient for the cook. First preheat the pan and then start cooking.

The frypan brings mother and her cooking to the table at the same time. Bacon and eggs, pancakes, French toast and many other dishes are cooked at the table as each member is ready for his serving. And they're cooked just right, thanks to the built-in thermostat.

Fried chicken, pan fried steak, pork chops, and skillet meals go modern in the new frypan and still come out with old fashioned goodness. French toast sandwiches brown evenly and quickly. It is also useful for thawing frozen food, heating rolls, baking potatoes, and steaming vegetables.

The teen-agers can treat the crowd with dessert pancakes using the frypan and ready mixed pancake flour. The pancakes are topped with frozen strawberries that have been thawed and the juice thickened with 3 tablespoons cornstarch and cooked with ½ cup maple syrup until thick. This with a dab of whipped cream will produce a deluxe pancake that will make competition for the banana split.

You're sure to agree that any appliance that provides so many services should be easily accessible on the shelf and will then become an essential for modern family living.

Popcorn Fun

By **HELENA DAVIDSON**

Here the 4-Hers enjoy hot buttered popped corn that Mrs. Hill has just prepared. This is a welcome snack at the close of their meeting.

There's food and fun a-plenty when the Hearts O'Lakes 4-H Club meets each month at a rural schoolhouse in Minnesota. Popping corn is often a part of the evening's entertainment. Mrs. DeVern Hill brought her electric corn popper to a recent meeting. The result was big bowls of popcorn as an extra treat. These 4-Hers also enjoy making colored popcorn balls or cutting up bright candies to add to the balls

Mrs. Hill uses her electric corn popper to prepare a treat for the Heart O'Lakes 4-H Club members. This is an easy way for her to provide refreshments for these active young people.

for celebrating various holidays.

Since the electric corn popper is simple to operate, there is no chore to preparing plenty of this popular treat. For best results follow instructions for use of your own make of popper. When the corn is popped, place it in a large bowl, add plenty of butter, and a generous sprinkling of salt. "There's only one caution," says Mrs. Hill. "Be sure to make plenty!"

Popcorn Balls

1 cup sugar
½ cup white syrup
½ cup water
¼ cup butter
¾ teaspoon salt
¾ teaspoon vanilla
3 quarts unseasoned popcorn

Place sugar, syrup, water, butter, and salt in saucepan and set over heat. Stir until sugar is dissolved. Continue cooking without stirring until syrup forms a brittle ball in water (270°F.). Add vanilla and stir. Place popped corn in a large bowl; pour cooked syrup slowly over corn—stirring as you pour. Wet or butter hands and form the popped corn mixture into balls with gentle pressure.

Gum Balls

Cut colored gum drops into small pieces and have ready to mix with corn as soon as the syrup is added. Butter the blades of kitchen shears to make cutting easier. Choose colored gum drops to observe the color scheme of special days such as red and green for Christmas, red for Valentine's day.

Peanut Balls

Add 1½ cups shelled peanuts to popcorn before adding syrup.

Pastel Popcorn Balls

Divide syrup into three parts and add food coloring. Pour over popcorn divided into three bowls. Mix and make balls of each color or combine from each bowl to make multi-colored balls.

Sewing Scholarship Winners

Bettye Kay Easely, 12, of Natchitoches, Louisiana was a second place winner and Kathleen Mae Harris of Vancouver, Washington placed fourth in the junior division of a national dressmaking contest held recently in New York. As their awards, Bettye Kay received a $400, and Kathleen a $250 scholarship. They were two of the four national finalists in the 10 to 13 year old division of an annual contest sponsored by Singer Sewing Machine Co. Because of the increased popularity of the contest, with almost 60,000 entries this year, it was divided into two divisions—senior (14 to 17 years) and junior (10 to 13 years).

Each girl who entered the contest selected her own pattern and material. Winners were chosen at local sewing center, regional, and national eliminations on coordination of fabric and design, construction, workmanship, fit, and finish.

Local winners received fitted scissor sets and regional placements were given Singer Slant Portable Sewing Machines with automatic zigzaggers. Second place regional winners received a Singer Featherweight Portable.

A selected number of the regional winner's garments were worn by professional models at the New York Fashion Show. The four national winners in each division modeled their own

dresses. These girls, accompanied by their mothers, enjoyed a three day visit to New York.

Bettye Kay is the daughter of Mr. and Mrs. Robert Easely. She has been sewing for two years and is in the seventh grade at Natchitoches Elementary School. A member of the 4-H Club, she did special project work for their achievement day. Her projects have been exhibited at the Natchitoches Parish Fair and Louisiana State Fair. As hobbies she enjoys fishing, hunting, and sewing.

Her winning dress was from a pattern of her own design. It was a scoop necked, full skirted dress of disciplined cotton in a Tell-a-Story print. A pleated cummerband marked the narrow waist with these colors repeated in the neckline edging. Petticoats under the dress were trimmed with bias that picked up the colors of the dress print. The outfit cost Bettye Kay $8.26 to make.

Kathleen, daughter of Mr. and Mrs. J. W. Harris, has been sewing for four years. A student in the eighth grade at Shumuay Junior High School, she is active in the choir and her church choir and young peoples group. She owns, in partnership with her sister, a half acre of black cap raspberry plants which they planted, cultivated, harvested, and marketed through the Washington Canners Coop. She is an associate member of this group.

Charles Bruder, Vice-President of the Singer Company presents a $400 check to Bettye Kay Easely.

Kathleen makes her own clothes and earns her spending money from the raspberries and from the eggs that she markets. Her hobbies are fishing and skiing.

Her outfit was a part dress of shantung chambray with a full gathered skirt released from a fitted bodice. The open square necked garment with tiny capped sleeves cost her $5.25 to make.

Next year's contest will start in the spring. Anyone interested can receive information from their local sewing center.

Anything you knit of Dacron yarn will wash easily and beautifully; will resist shrinking, bagging, and stretching; will wear very well indeed—and will never need blocking after washing.

Junior winners are left to right—4th place, Kathleen Mae Harris; 3rd place, Peggy Vikakis; 2nd place, Bettye Kay Easely; and 1st, Nancy Ann Archie.

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Apple Walnut Bread

Have You Had an Apple Today?

Use It Raw or Cooked in Breads or Cakes

What is as tasty as a crisp juicy raw apple? And it's just as good when used in pies, cakes, breads or main dishes. Used either raw or as applesauce, it adds a fresh flavor to the baked product and also helps to keep it from drying out.

Apple Walnut Bread

This apple walnut bread is good for lunch box sandwiches, for afternoon teas, or for snacks. It keeps well and tastes fresh to the last crumb.

¼ cup shortening
⅔ cup sugar
2 eggs, well beaten
2 cups sifted flour
1 teaspoon baking powder
1 teaspoon baking soda
1 teaspoon salt
2 cups coarsely grated raw apple
1 tablespoon grated lemon peel
⅔ cup chopped walnuts

Cream shortening and sugar until light and fluffy; beat in eggs. Mix and sift flour, baking powder, soda, and salt; add alternately with the grated apple to the egg mixture. Stir in lemon peel and walnuts (batter will be stiff). Bake in greased and floured loaf pan, 8x5x2 inches, at 350° F. for 50 to 60 minutes. Do not slice until cold.

Quick Applesauce Cake

Applesauce blended with spices furnishes the moisture for this quick cake. It's a cake you'll want to serve often.

⅔ cup shortening
2½ cups sifted cake flour
1⅔ cups sugar
3½ teaspoons baking powder
1 teaspoon salt
¾ cup thin applesauce
3 eggs
½ teaspoon cinnamon
¼ teaspoon ground cloves
½ cup thin applesauce

Put into a mixing bowl the shortening, flour, sugar, baking powder, salt, and ¾ cup applesauce. Beat with an electric mixer at medium speed for 2 minutes. Scrape the side and bottom of the bowl during mixing. Add eggs, spices, and ½ cup applesauce and beat 2 minutes longer. Turn batter into 2 greased 9-inch layer cake pans. These should be 1½ inches deep. Bake at 350°F. for 35 minutes. If the applesauce is bland in flavor add 1 tablespoon lemon juice before measuring.

Frost with favorite icing while the cake is still warm. This allows the frosting to melt just a little and harden with a glaze.

Dutch Apple Cake

Dutch apple cake has long been a favorite in many homes. It may be used as a hot bread for breakfast or lunch or a simple dessert for dinner.

1½ cups sifted flour
⅓ cup sugar
2 teaspoons baking powder
¾ teaspoon salt
⅓ cup shortening
1 egg, beaten
½ cup milk
3 medium-sized apples
½ teaspoon cinnamon
2 tablespoons fat
2 tablespoons mild syrup

Sift together flour, 3 table-

Fashion Charmers

2265 Figure-enhancing charmer with fashion interest at its neckline. You'll find it easy-to-make, wonderfully flattering and youthful! Note the soft flare to its skirt. Sizes 14 to 48. Size 18: 3¾ yds. 35-in.; 3½ yds. 39-in.

2423 Faultless little suiter to wear more and more as you recognize its many talents! Its moulded torso overblouse does wonderful things for your figure, its skirt flares to a great width. Sizes 10 to 20. Size 16: 6 yds. 39-in.

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Add FIVE CENTS for EACH pattern for first class mailing.

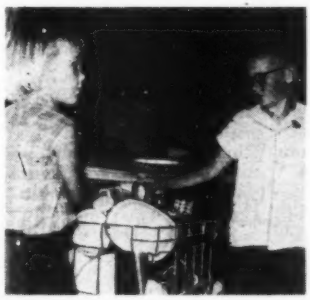
For FALL-WINTER FASHION BOOK, add TWENTY-FIVE CENTS.

spoons sugar, baking powder, and salt. Cut in ⅓ cup fat with pastry blender. Combine egg and milk and add to dry mixture. Mix to a soft dough. Spread dough in a shallow greased pan. Pare, core and slice apples. Place on dough in rows of overlapping slices. Mix remaining sugar with cinnamon and sprinkle over apples. Bake at 375°F. for 40 to 45 minutes. Remove from oven and pour syrup over apple topping.

Power Washed Dishes

. . . . . (Here from page 14)

If the water was hard and the iron content high there was a tendency for spotting, film, and iron rust deposits on the dishes. However this was overcome



Buddy and Rachel are the children of Mr. and Mrs. Noel Adams, Alvin, Texas. Their baby enjoys the benefits of mother's electric dishwasher. It sterilizes the bottles. They also use a pasteurizer to pasteurize milk for the baby's formula. Because Mr. Adams works late in his rice fields during certain seasons of the year, the evening meal is often eaten as late as 9 pm. This does not keep Mrs. Adams in the kitchen "all night"—her electric dishwasher takes over.

when the water was softened at the source.

Homemakers who participated in the study appreciated the relief from boredom of dishwashing drudgery. They liked being able to stack the dishes out of sight in the dishwasher until they had a full load. And entertaining took on a relaxing air without the pressure to "get the dishes done."

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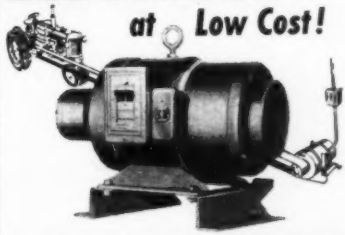

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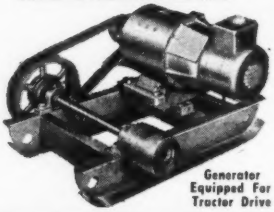

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4-H Electric Winners

Six Top State Winners Each Receive Scholarship for Outstanding Projects

Forty-one rural boys and girls across the country who excelled in electrical projects to improve their farms and homes were awarded expense-paid trips to the National 4-H Club Congress in Chicago recently.

Top winners in their states, the 33 boys and 8 girls, were selected from more than 100,000 participants in the 20th annual 4-H Electric Program. The awards donor for the Program is the Westinghouse Educational Foundation, which is supported by Westinghouse Electric Corp. The Foundation provided the Club Congress trips, and also presented $300 college scholarships to six national winners selected from the group. The 4-H Electric Program is conducted by the State Cooperative Extension Services and is arranged by the National Committee on Boys and Girls Club Work, Inc., Chicago, Ill.

These state winners raised to a total of 667 the number of farm youths who have been awarded Club Congress trips by Westinghouse since the 4-H Electric Program was founded 20 years ago. A total of 111 college scholarships have been awarded. When the Program started there were only 2,000 participants, and since that time more than 700,000 farms boys and girls have enrolled. In the same period, electrification of the nation's farms has increased from 10% to 95%. This year 640 electric power suppliers participated in the 4-H Electric Program throughout the country.

The state winners are all holders of numerous blue ribbons for

A. C. Monteith, center, vice-president of Westinghouse Apparatus Division presented college scholarships to each of the six national winners at the 20th annual 4-H Club Electric Program in Chicago. Receiving scholarships were, left to right: Rodney G. Rockwell, Pueblo, Colo.; Jerry Lasseter, Gadsden, Ala.; John Roy Hart, West Hamlin, W. Va.; Miss Ida Jo Berger, Goode, Va.; Loren Boppart, Woodstock, Ill.; and Richard E. Harke, Orangevale, Calif.

their demonstrations and display of projects at state and county fairs. They conducted a wide variety of electrical projects to improve their farms and homes. These projects included a crystal radio set, rewiring planning for an entire farmstead, demonstration board showing hazards of overloaded electric circuits, and an electric guitar. One boy even built an automatic telephone answerer consisting of two types of recording heads, two synchronous motors, an amplifier assembly, two speakers, a microphone, and associated equipment.

Following is a brief resume of the work that won national awards for six of these young folks:

Jerry Lasseter, 17, lives on a 70-acre farm near Gadsden, Alabama. He has been an active 4-H member since he was eight years old. Having been associated with 4-H activities for nine years, three of which have been spent in the electric program, Jerry has held a number of offices in his local 4-H Club, including the posts of president, song leader and reporter. During his three years in the electric program, he has participated in leadership and land upkeep projects. His demonstration on wiring of a motor, which at one meeting was shown to representatives from 11 counties, brought him deserved recognition in the form of county and state prizes. In addition he has twice presented this prize-winning demonstration at his own school. Jerry comes from a family that is enthusiastic about the value of 4-H training. Four other Lasseter children are also taking an active interest in 4-H work. Jerry considers that his 4-H training, in addition to its long-range benefits, has already been of practical value to him, enabling him to earn money raising crops and livestock.

Richard E. Harke, 16, of Orangevale, California, has been an active member of his 4-H Club for six years. During the last three years he has devoted much of this time to the electric program which also has helped with his swine project. In his first year of electrical work he made pig brooders and outdoor light fixtures, improved his home with better lighting and gave several electrical demonstrations. The following year he built a chicken brooder. Other products include two tool grinders, an electric tester, an amplifier, and an oscillator. A high school senior, Richard intends to major in electrical engineering at college. For his many activities in the 4-H over-all program, he has won numerous awards including blue ribbon ratings in demonstrations, livestock judging and showmanship.

Rodney Rockwell, 18, of Pueblo, Colorado, has worked on numerous electrical projects and given demonstrations on the subject before large audiences and on television programs. In 4-H work eight years, one of his most unusual projects was the building of a sump pump using a 50 gallon barrel, a float switch, a one pound coffee can for a float and a rubber paddle pump with a ½ hp motor. Aided by his club leader, who is a licensed electrician, Rodney also completely rewired a large 50 year old building. This job required a new service entrance, 1,000 feet of conduit, 5,000 feet of wire and the installation of more than 100 outlets. One of his demonstrations on the effect of poor wiring and the hazards of overloading electrical circuits has been presented before 500 people at 20 different meetings, and on a television program. Rodney is a former officer of his local 4-H electric club, and is now its junior leader. He reports his interest in the electric program had led to his decision to become an electrical engineer. He is attending Colorado A. & M. College.

Loren Boppart, 21 of Woodstock, Illinois, planned and completed an extensive electrical program on his father's 260-acre farm. With the help of a contractor and a utility representative, he rewired every building on the farm, installed a central pole with a 200 ampere switch to provide electrical service closer to all buildings, installed wiring from the switch to the buildings underground, installed an electrical corn crib loader and heat

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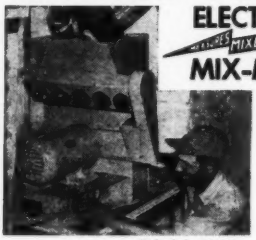

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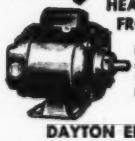

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lamps in the hog house, repaired motors, built an electrical water pump and constructed an all-electric milk house and an electrical workshop. Loren, who is a leader in his electric club and was its president last year, also installed separate fuse boxes in the 200 ampere switch so that electricity can be cut off in the event of fire, but power to the electric water pump continues. A 4-H'er six years, Loren received the Illinois 4-H Key Club award last year for his outstanding work in the community. He plans to attend college and study electrical engineering.

Ida Jo Berger, 19, of Goode, Virginia, who credits her "4-H experiences as having had an important part in the decision to select Extension Service work as my career," will bring a well-rounded 4-H background to her life work. Enrolled for four years in the electric program, she has given 11 electrical demonstrations and has made 36 items of electrical equipment, including: an infrared chicken brooder (to replace a wood-burning model) ing milk cans; extension cords; constructed from the tub of an old vat originally used for wash-lamps and shades of all sizes, two

Names and Addresses of 4-H Electric Program Winners

State	*Name of Winner*	*Address*
*Alabama	Jerry Lasseter	Gadsden
Arkansas	Wayne Pyles	Booneville
*California	Richard E. Harke	Orangevale
*Colorado	Rodney Rockwell	Pueblo
Connecticut	Donald Urbanik	Oakdale
Florida	Earl Eugene LaRoe	Eustis
Georgia	Jeannie Underwood	Midville
Idaho	Floyd Hansen	Potlatch
*Illinois	Loren Boppart	Woodstock
Indiana	Rebecca (Becky) Bryant	Bloomington
Iowa	Howard Keitzer	Mediapolis
Kansas	Harold Swearingen	Independence
Kentucky	Carl F. Haunz, Jr.	Louisville
Louisiana	Bertha Nan Scott	Winnsboro
Maryland	Woodrow Adkins	Salisbury
Michigan	Donald Davis	Bay City
Minnesota	Duane Adams	Cosmos
Mississippi	Marjorie Payne	Rolling Fork
Missouri	Vernon Naeger	River Aux Vases
Montana	Gilbert Passmore	Creston
Nebraska	Robert Ambrosek	Haigler
Nevada	Raymond McAllister	Gardnerville
New Hampshire	Richard Haney	Groveton
New Mexico	Jerry Elliott	Carlsbad
North Carolina	Jackie Leo Morris (Boy)	Tyner
North Dakota	Elroy Lindaas	Mayville
Ohio	James G. Belleson	Sinking Spring
Oklahoma	Wylie S. Hough, Jr.	Ardmore
Oregon	Stephen Thayer	Oswego
Pennsylvania	Sandra Romanetti	Avella
Rhode Island	Ronald Powsner	Providence
South Carolina	Franklin Sutherland, Jr.	Abbeville
South Dakota	Helen Wiles	Brookings
Tennessee	Lois Jeter	Church Hill
Texas	John Caldwell	La Feria
Utah	Ned Huntsman	Castle Dale
Vermont	Richard Stevens, Jr.	Springfield
*Virginia	Ida Jo Berger	Goode
Washington	Eugene Odell	Davenport
*West Virginia	John Roy Hart	West Hamlin
Wisconsin	Werner Stettler, Jr.	Alma
Hawaii	†Albert Kuroyama	Holualoa
Puerto Rico	†Gloria Esther Rodriguez	Isabela

*Denotes National Winner

†Received $100 Bond instead of trip to Club Congress

of which were prize-winners. All told in 10 years of 4-H membership, she has participated in 16 different projects and activities, made 192 articles, preserved 1149 quarts of food, prepared 115 meals and 65 breads, earned more than $1,000, served as president and reporter for her local club and as Big Chief of her county All-Star Chapter. She is also a junior leader. At New London Academy, from which she graduated in 1954, Ida Jo was president of the Beta Club, an editor of the school paper and class editor of the annual. In her "spare time," she aided younger 4-Hers with their projects, worked with church youth groups and went in for cooking, reading and piano as hobbies. Now a sophomore at Madison College, Harrisonburg, Va., majoring in home economics, Ida Jo is equally active in extra-curricular doings. She is sophomore representative to YWCA cabinet, is on the staff of the school paper, serves as co-chairman of script committee for sophomore Class Show, and holds membership in several clubs including the Home Economics Club and an honorary scholastic society. Home for Ida Jo is a 226-acre dairy farm.

John Roy Hart, 17, Lincoln, West Virginia, has interests ranging from the building of electrical equipment for use around the farm to soil fertilization projects. He has constructed such equipment as a poultry water warmer, a portable lawn lamp and an electric hotbed made from a design taken from his 4-H electric program circular. He also won a blue ribbon in a state contest in which he gave a soil fertilization demonstration. "How to Convert a Cheap Lamp for Better Light," was the title of a demonstration which won John a Blue Award in a regional competition. John, who has served as president and vice president of his local 4-H Club, is intensely interested in flying and serves as an officer in the Civil Air Patrol Cadet Corps. A senior at Glyan Valley High School, he plays trombone in the school band. John hopes to attend Virginia Polytechnic Institute where he will study architecture.

Convenient Clock

This clock in the window catches the attention of every one who drives to the home of the Albert Festerling family, Bay City, Michigan.

The clock can be seen from

their shaded outdoor living room, flower garden, outdoor grill, garage, and children's play space.

Placing the clock in the window wasn't deliberate. It happened through a chain of events. Festerling tinkered with his old kitchen clock until he got it to run (two clock repairmen said it couldn't be done) and then mounted it on the wall over his workbench. Whenever he was at work in the basement, his children were constantly coming to the window and asking the time, so he faced the clock to the window. This left him without a timepiece so he "rigged up" the pivot to the satisfaction of all.

Now with merely a "twist of the wrist" the clock can be viewed from inside or outdoors.

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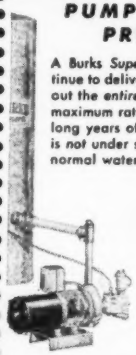

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Electrifying a Lawn Mower

This is a Good Project for Spare Time During Forthcoming Winter Evenings

John Cain's experience with the good earth is limited to mowing grass. But that is enough to make him appreciate *Electricity on the Farm Magazine* as much as do the thousands of real dirt farmers who read this publication regularly. For out of the June-July, 1951, issue came a solution to a very serious personal problem.

You see, Cain, who resides in Rockville Centre, Long Island, and who works as a foreman in the electrical division of Republic Aviation Corporation's manufacturing department, has a slight heart condition. He used to enjoy pushing a lawn mower. That pleasant chore, however, is now a thing of the past. His doctor advised against it—and also ruled out Cain's suggestion that he substitute an engine driven mower for manpower. Such motors, the doctor said have to be started with a sharp tug on a rope or some other manually-operated mechanism. Whatever the method, medical experience indicates that the quick action needed and the consequent pull involved in starting a mower engine might cause further injury to Cain's already strained heart muscles.

He'd either have to buy an electric lawnmower or electrify his present mower. Being an enthusiastic do-it-yourself man, Cain chose the latter course. Basic directions for the job came from the pages of the previously mentioned issue of this magazine. Here are the steps he followed in putting to use his extra ¼ hp motor and a few hours of spare time:

- Removed the cutter blade assembly from the motor.
- Cut one inch off the right hand side of the blades so that a 5-inch pulley would slip on the shaft and clear the inside wheel assembly by about 1 inch.
- Attached the pulley to the shaft. (Since the hole in the pulley was only 5/16 of an inch in diameter, it was too small to clear a hub on the shaft. The hole was enlarged to ⅜ of an inch. This enabled it to pass over the hub with room to spare, and necessitated inserting a split bushing in the pulley hole so that it would fit snugly on the shaft. Apparently, this is a common problem with a number of manually operated mowers.)
- Replaced the cutter blade with pulley in place on shaft.
- Removed both wheels of the mower and reversed their pinion gear. (This is necessary to enable the mower to move forward under its newly acquired motor drive.)
- Replaced the wheels making certain that the gears meshed.
- Attached a 7 in. by 4 in. metal plate—⅜ of an inch thick—to the top of the supporting or front bar of the mower. Six bolts were used in this operation. Four were inserted through the strap plate on either side of the bar, and two passed directly through both the strap and bar

Cain removed both wheels and reversed the pinion gear. This enables the motor to move the mower forward.

Cain's completed power mower. He belted a ¼ hp 1750 rpm motor to the shortened cutter bar. Also note his toggle switch control and outlet box near the handle. He plugs the motor extension cord into this box.

just behind the motor mounting.

- Attached a ¼ hp, 1750 rpm motor to the plate, locating it just ahead of the supporting bar so that it did not tip the mower forward when mower was in cutting position.
- Belted motor to cutter blade pulley. (Cain's motor belt is 28 inches long and had to be cut and spliced to size.)

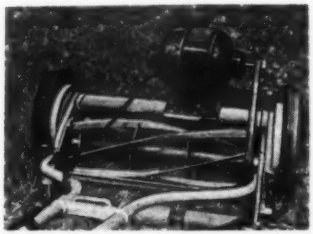
The remainder of the job included some ideas which are not always present in similarly electrified lawnmowers. First, Cain attached a double pole toggle switch to a point near the handle. The device used has two outlets, rather than one, because that is the type which Cain had on hand. One section of the cable goes from the motor to the switch, which is attached to a standard 4-inch box. The other section goes to the electrical supply—a 115-volt receptacle in the garage.

The double pole switch is both a convenience and a safety measure. It is located close enough to the handle of the mower so that the motor can be flicked off and on as desired. And, when the switch is turned off, the motor is "dead," thereby eliminating any possible danger of shock. The double pole switch is cheaper than polarized plugs, which Cain advocates as a safety measure in event that the switch suggested is not used.

For best results with an electric mower, mow back and forth in straight lines across your lawn. Always work away from the electrical outlet so the power cord lies on the cut-over area. In that way you won't be in danger of cutting the cord.

Use only heavy-duty, rubber-covered cord with a No. 16 conductor wire, or heavier, for 100 feet of cord on a ¼ hp motor. Check the cord frequently to see that there are no breaks in the insulation.

By Russell Gingles



The cutter reel blades were shortened one inch to permit attachment of pulley at right end. The motor is belted directly to this pulley.

Store Feed in Bulk

Bulk feed bins save money, labor, and prevent damage to grain bags by rats and mice, according to a report by Colorado A and M College. About 80 cubic feet of bin space is needed to hold a ton of dairy feed, 70 cubic feet for a ton of poultry mash and from 40 to 70 cubic feet for a ton of small grain.

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Questions and Answers

Raising Infrared Lamps

▶**Question:** *What procedure should be followed in raising infrared lamps as the chicks grow older?*

J.L.K., Pennsylvania

▶**Answer:** You should start with the lamp 18 inches above the floor. They should not be raised more than 1 inch a week or 2 inches every other week. There is no real necessity for raising them the first week or two. No advantage is gained by raising the lamps higher than 24 inches. It is good to have a hot spot directly under the lamp, preferably a little bit too warm for the chicks. A chilled chick can move into this spot, warm up quickly, and then find out it is too warm to stay there. After that the chick moves out to a spot to suit its individual comfort. This leaves the hot spot empty and eliminates the possibility of a pile-up in the middle.

Grounding TV Antenna

▶**Question:** *Does an outdoor TV antenna need to be grounded and if it is grounded, will it serve as lightning protection for the building?*

G.I.T., South Dakota

▶**Answer:** An outdoor television antenna should definitely be grounded. The best and cheapest way to get this done is at the time the antenna is installed. The antenna should not be grounded to the electric service ground rod, but rather a separate rod is needed. If the antenna ground rod and the electric service ground rod are 6 feet or less apart, they should be connected together with proper wire and clamps. The antenna lead-in should also be grounded to the antenna ground rod through a lightning arrestor installed in the lead-in wires outside the house.

A grounded television antenna is no substitute for a lightning rod system. A complete, properly installed, "master label" system is recommended.

Infrared Lamp Wattages

▶**Question:** *In what wattages can infrared lamps be obtained?*

W.L.P., Indiana

▶**Answer:** Infrared lamps come in three sizes, 125 watts, 250 watts, and 375 watts. They are directly proportional as to the radiant energy transmitted. Saying it another way, two 125 watt lamps may be equivalent to one 250 watt lamp. You will not, however, get as high a concentration of heat in one spot using two 125 watt lamps as you would with one 250 watt lamp. The same is true for the 375 watt size. If five 375 watt lamps are used, spaced about 30 inches apart on the circumference of a 4 ft. circle, they will brood 500 chicks just as well as eight 250 watt lamps according to tests at New Hampshire with temperatures as low as 14°F.

Plastic Pipe and Freezing

▶**Question:** *Will plastic pipe, used for a lawn sprinkler installation, be damaged by freezing if it is not drained?*

H. S., Colorado

▶**Answer:** For this type of installation plastic pipe should be buried under the surface of the lawn to protect it against damage by sunlight as well as against physical injury. Light frost does not damage the plastic pipe since the pipe itself will stretch enough to prevent bursting in the event the water freezes. However, after the lawn sprinkling season is over, it would be advisable to drain the pipe, if possible, since continued freezing and thawing and the resulting stretching of the pipe will in time cause fatigue of the pipe and failure or rupture results. Also, during cold weather plastic pipe tends to become quite brittle. If there is a slight upheaval of the earth, and the pipe is frozen solid with a column of ice in it, it would be more susceptible to breakage than if it were empty. When laying the pipe, it should be put down in a zigzag or snakelike line to allow enough extra pipe for contraction or movement of the earth.

The electric lamp touches the lives of more people more often and in more different ways than any other manufactured product.

Awards for October Rhyme Contest

There was a young man from Ipswitch
Who each day manure had to pitch
If only he knew
What a barn cleaner'd do

? ? ? ? ? ?

The Winning Last Lines

FIRST PRIZE—$25 CASH

"That pitchfork would rust in its niche!"

Mrs. D. W. Dunlop
R.F.D. 1, Mukwonago, Wisc.

SECOND PRIZE—$10 CASH

"This chore onto Watts he would hitch."

Oliver Endsley
R.F.D. 3, West Branch, Iowa

Five Consolation Prizes $3 Each

"His arms from fatigue would not twitch."

Mrs. Sadie W. Edwards
R.F.D. 3, Inman, S. Carolina

"In less chore time his lot he'd enrich."

T. J. Martin
Scotland, Conn.

"He'd flip a switch to clean every niche."

Anna Denny
R.F.D. 2, Springville, Ind.

"He'd trade pitchfork for shuttle-stroke hitch."

Mrs. Vernon Slocombe
R.F.D. 1, Peabody, Kansas

"As a 'servant', to make you feel rich."

Mrs. Isabel B. Rex
R.F.D. 2, Pottstown, Pa.

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Dale Baker, Bremen, Indiana; Mrs. Ray Bowyer, Brookfield, Mo.; Duncan Cameron, Escanaba, Mich.; Maurice G. Cox, Guthrie, Oklahoma; Mrs. Leo J. Gasper, Baraboo, Wisc.; Henry M. Hatton, Seaman, Ohio; Mrs. Henry M. Hatton, Seaman, Ohio; Mrs. Ernest Hermens, Forest Grove, Oregon; Sally Koziar, Pitman, Pa.; Judith A. Meise, Sauk City, Wisc.; George G. Nelson, River Falls, Wisc.; Mrs. John E. Parks, Sr., Gary, Indiana; Mrs. Harry Popejoy, St. Helens, Oregon; Miss Blanche Porter, Fargo, Oklahoma; Mrs. Bessie Premo, Johnson, Vt.; Floyd H. Putt, Allegany, N. Y.; Harold Sayre, Alexandria, Indiana; Hayda L. Shaffer, New Wilmington, Pa.; Mrs. Gloria Stoltenberg, Walcott, Iowa; Mrs. Marvin Warren, Colgate, N. Dak.; Erik J. Wheaton, Landis, Sask., Canada; Carol Diane Yoder, Parnell, Iowa; and Mrs. Robert Young, Markleville, Indiana.

1956

BUYER'S GUIDE

of

Electric Farm Equipment

&

Household Appliances

An index of Electric Farm Productive Equipment and Home Appliances available from the manufacturers who have advertised in this magazine during the past year. For further information and name of your nearest dealer, write directly to these manufacturers, mentioning that you obtained their name from Electricity on the Farm Magazine. They will be glad to help you.

If you desire the names of manufacturers of specific equipment not included in this guide, write to:

Reader Service Department
ELECTRICITY ON THE FARM MAGAZINE
305 East 45th Street
New York 17, N. Y.

Electric Farm Equipment

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James Mfg. Co., Fort Atkinson, Wisc.
The Louden Machinery Co., Fairfield, Iowa
Patz Company, Pound, Wisc.
Starline, Inc., Harvard, Ill.

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Pioneer Gen-E-Motor Corp., Chicago 39, Ill.

BINS, GRAIN DRYING
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American Crop Drying Co., Crystal Lake, Ill.
Clay Equipment Corp., Cedar Falls, Iowa

BLOWERS, GRAIN OR HAY
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Burrows Equipment Company, Evanston, Ill.

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Rhinehart Mfg. Co., Inc., Ft. Wayne 7, Ind.

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Rhinehart Mfg. Co., Inc., Ft. Wayne 7, Ind.

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Wrap-On Co., Chicago 10, Ill.

CANDLERS, EGG
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J. W. Hance Mfg. Co., Westerville, Ohio

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Sunbeam Corp., Chicago 50, Ill.

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Farmer-Feeder Co., Inc., Cambridge City, Ind.
Master-Bilt Refrigeration Mfg. Co., St. Louis 7, Mo.

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Richardson Electric, Monroe, Wisc.
Starline, Inc., Harvard, Ill.

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Natl. Agric. Supply Co., Fort Atkinson 40, Wisc.

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Sunbeam Corp., Chicago 50, Ill.

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Rhinehart Mfg. Co., Inc., Ft. Wayne 7, Ind.
Smith-Gates Corp., Plainville, Conn.

DRAINAGE WELLS

Knickerbocker Stamping Co., Parkersburg, W. Va.

DRIERS, CROP

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Amer. Crop Drying Co., Crystal Lake, Ill.
Clay Equipment Corp., Cedar Falls, Iowa
Delco Products Div., Gen. Motors Corp., Dayton 1, Ohio
The Louden Machinery Co., Fairfield, Iowa

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Clay Equipment Corp., Cedar Falls, Iowa
Dayton Electric Mfg. Co., Chicago 12, Ill.
The Farmway Company, Manawa, Wisc.
James Mfg. Co., Fort Atkinson, Wisc.
The Louden Machinery Co., Fairfield, Iowa
Smith-Gates Corp., Plainville, Conn.
Starline, Inc., Harvard, Illinois

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Habco Mfg. Co., Columbus, Nebr.
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James Mfg. Co., Fort Atkinson, Wisc.
Rowell, Inc., St. Paul, Minn.
Starline, Inc., Harvard, Ill.

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H. C. Davis Sons Mill Machinery Co., Bonner Springs, Kans.
Decker Mfg. Co., Rockford, Ill.
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Horvick Mfg. Co., Moorhead, Minn.

GRINDERS, TOOL

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Sunbeam Corp., Chicago 50, Ill.

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Amer. Crop Drying Co., Crystal Lake, Ill.
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Delco Products Div., Gen. Motors Corp., Dayton 1, Ohio
The Louden Machinery Co., Fairfield, Iowa

HEATERS, AIR, FAN TYPE

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Electrend Machine Co., St. Joseph, Mich.
Electromode Corp., Rochester 3, N. Y.
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James Mfg. Co., Fort Atkinson, Wisc.

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Fairbanks, Morse & Co., Chicago 5, Ill.

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General Electric Co., Schenectady 5, N.Y.

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SHARPENERS, SAW

Foley Mfg. Co., Minneapolis 18, Minn.

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Paragon Electric Co., Two Rivers, Wisc.

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Burrows Equipment Co., Evanston, Ill.

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Lyon Rural Electric, San Diego 12, Calif.
Smith-Gates Co., Plainville, Conn.
Wrap-On Company, Chicago 10, Ill.

TOOLS, MECHANIC'S HAND

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J. W. Hance, Westerville, Ohio

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Badger Northland, Inc., Kaukauna, Wisc.
Clay Equipment Corp., Cedar Falls, Iowa
James Mfg. Co., Fort Atkinson, Wisc.
Patz Company, Pound, Wisc.
Railoc Company, Inc., Plainfield, Ill.
Rowell, Inc., St. Paul, Minn.
Starline, Inc., Harvard, Ill.
Van Dale Farm Machines, Inc., Wayzata, Minn.

UNLOADERS, WAGON

Flinchbaugh Co., York, Pa.

WARMERS, POULTRY WATER

Smith-Gates Corp., Plainville, Conn.

WASHERS, EGG

Whirl-A-Way Egg Washer Co., Harrisburg, Pa.

WATERERS, HEATED, POULTRY

Rhinehart Mfg. Co., Inc., Ft. Wayne 7, Ind.
Ritchie Manufacturing Co., Conrad, Iowa
Smith-Gates Corp., Plainville, Conn.

WATERERS, HEATED, STOCK

Clay Equipment Corp., Cedar Falls, Iowa
Farmer Feeder Co., Inc., Cambridge City, Ind.
Hawkeye Steel Products, Inc., Waterloo, Ia.
Nelson Mfg. Co., Cedar Rapids, Iowa
Rhinehart Mfg. Co., Inc., Ft. Wayne 7, Ind.
Ritchie Manufacturing Co., Conrad, Iowa

WATER PURIFIERS

Sepco Corp., Pottstown, Pa.

WATER TREATMENT

F. E. Myers & Bro. Co., Ashland, Ohio
Oshkosh Filter & Softener Co., Oshkosh, Wisc.
Wallace & Tiernan, Inc., Belleville 9, N. J.

Household Appliances

AIR CONDITIONERS

Frigidaire Div., General Motors Corp., Dayton 1, Ohio

Hotpoint Co., Chicago 44, Ill.

Kelvinator Div., Amer. Motors, Detroit 32, Mich.

Westinghouse Electric Corp., Springfield, Mass.

BED COVERINGS, ELECTRIC

Sunbeam Corp., Chicago 50, Ill.
Westinghouse Electric Corp., Mansfield, Ohio

BLENDER

Hamilton Beach Co., Div. of Scoville Mfg. Co., Racine, Wisc.

CLIPPERS, HOME HAIR

Electro Tool Corp., Racine, Wisc.

COFFEE MAKERS

Dormeyer Corp., Chicago 10, Ill.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Electric Corp., Mansfield, Ohio

DEHUMIDIFIERS

Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Westinghouse Electric Corp., Springfield, Mass.

DISHWASHERS, AUTOMATIC

Frigidaire Div., General Motors Corp., Dayton 1, Ohio
Hotpoint Co., Chicago 44, Ill.
Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Westinghouse Electric Corp., Mansfield, Ohio

DISPOSAL UNITS, FOOD WASTE

Hotpoint Co., Chicago 44, Ill.
Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Westinghouse Electric Corp., Mansfield, Ohio

DRYERS, CLOTHES

Frigidaire Div., General Motors Corp., Dayton 1, Ohio
Hotpoint Co., Chicago 44, Ill.
Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Westinghouse Electric Corp., Mansfield, Ohio

EGG COOKERS

Sunbeam Corp., Chicago 50, Ill.

FANS, ATTIC VENTILATION

Dayton Electric Mfg. Co., Chicago 12, Ill.
Smith-Gates Corp., Plainville, Conn.

FANS, KITCHEN VENTILATION

Dayton Electric Mfg. Co., Chicago 12, Ill.

FANS, PORTABLE

Argus Mfg. Co., Chicago 51, Ill.
Dayton Electric Mfg. Co., Chicago 12, Ill.
Westinghouse Electric Corp., Springfield, Mass.

FILTERS, IRON REMOVAL

F. E. Myers & Bro. Co., Ashland, Ohio
Oshkosh Filter & Softener Co., Oshkosh, Wisc.

FREEZERS, FARM FOOD

Frigidaire Div., General Motors Corp., Dayton 1, Ohio
Hotpoint Co., Chicago 44, Ill.
Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Westinghouse Electric Corp., Columbus, Ohio

FRYERS, DEEP FAT

Dormeyer Corp., Chicago 10, Ill.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Electric Corp., Mansfield, Ohio

FRY-PAN

Dormeyer Corp., Chicago 10, Ill.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Electric Corp., Mansfield, Ohio

GRILLS

Westinghouse Electric Corp., Mansfield, Ohio

HEATERS, PORTABLE

Electromode Corp., Rochester 3, N. Y.

HEATERS, WATER

Fairbanks, Morse & Co., Chicago 5, Ill.
Frigidaire Div., General Motors Corp., Dayton 1, Ohio
Hotpoint Co., Chicago 44, Ill.
Kelvinator Div., Amer. Motors, Detroit 32, Mich.
Monarch Range Co., Beaver Dam, Wisc.
Sepco Corp., Pottstown, Pa.
Westinghouse Electric Corp., Mansfield, Ohio

HEATING PADS

Westinghouse Electric Corp., Mansfield, Ohio

HOT PLATES

Westinghouse Electric Corp., Mansfield, Ohio

IRONS, ELECTRIC, DRY OR STEAM

Dormeyer Corp., Chicago 10, Ill.
Sunbeam Corp., Chicago 50, Ill.
Westinghouse Electric Corp., Mansfield, Ohio

IRONERS

Kelvinator Div., Amer. Motors, Detroit 32, Mich.

MIXERS, FOOD

Dormeyer Corp., Chicago 10, Ill.

Hamilton Beach Co., Div. of Scoville Mfg. Co., Racine, Wisc.

Sunbeam Corp., Chicago 50, Ill.

Westinghouse Electric Corp., Mansfield, Ohio

MOTORIZING SET FOR SEWING MACHINE

Dayton Electric Mfg. Co., Chicago 12, Ill.

RANGES—COMBINATION

Monarch Range Co., Beaver Dam, Wisc.

RANGES, ELECTRIC

Frigidaire Div., General Motors Corp., Dayton 1, Ohio

Hotpoint Co., Chicago 44, Ill.

Kelvinator Div., Amer. Motors, Detroit 32, Mich.

Monarch Range Co., Beaver Dam, Wisc.

Westinghouse Electric Corp., Mansfield, Ohio

REFRIGERATORS

Frigidaire Div., General Motors Corp., Dayton 1, Ohio

Hotpoint Co., Chicago 44, Ill.

Kelvinator Div., Amer. Motors, Detroit 32, Mich.

Westinghouse Electric Corp., Columbus, Ohio

ROASTERS

Westinghouse Electric Corp., Mansfield, Ohio

SEWING MACHINES

Singer Sewing Machine Co., New York 6, N. Y.

SHAVERS

Sunbeam Corp., Chicago 50, Ill.

SOFTENERS, WATER

Fairbanks, Morse & Co., Chicago 5, Ill.

F. E. Myers & Bro. Co., Ashland, Ohio

Oshkosh Filter & Softener Co., Oshkosh, Wisc.

Webb Mfg. Co., Parkville, Mo.

TIMERS

Paragon Electric Co., Two Rivers, Wisc.

TOASTERS

Dormeyer Corp., Chicago 10, Ill.

Sunbeam Corp., Chicago 50, Ill.

Westinghouse Electric Corp., Mansfield, Ohio

TOILETS, ELECTRIC FLUSHING

McPherson, Inc., Tampa 3, Fla.

VACUUM CLEANERS

Hamilton Beach Co., Div. of Scoville Mfg. Co., Racine, Wisc.

Singer Sewing Machine Co., New York 6, N.Y.

Sunbeam Corp., Chicago 50, Ill.

Westinghouse Electric Corp., Mansfield, Ohio

VIBRATORS

Beauty Appliance Co., Racine, Wisc.

WARMERS, BABY BOTTLE

Sunbeam Corp., Chicago 50, Ill.

WASHERS, CLOTHES

Frigidaire Div., General Motors Corp., Dayton 1, Ohio

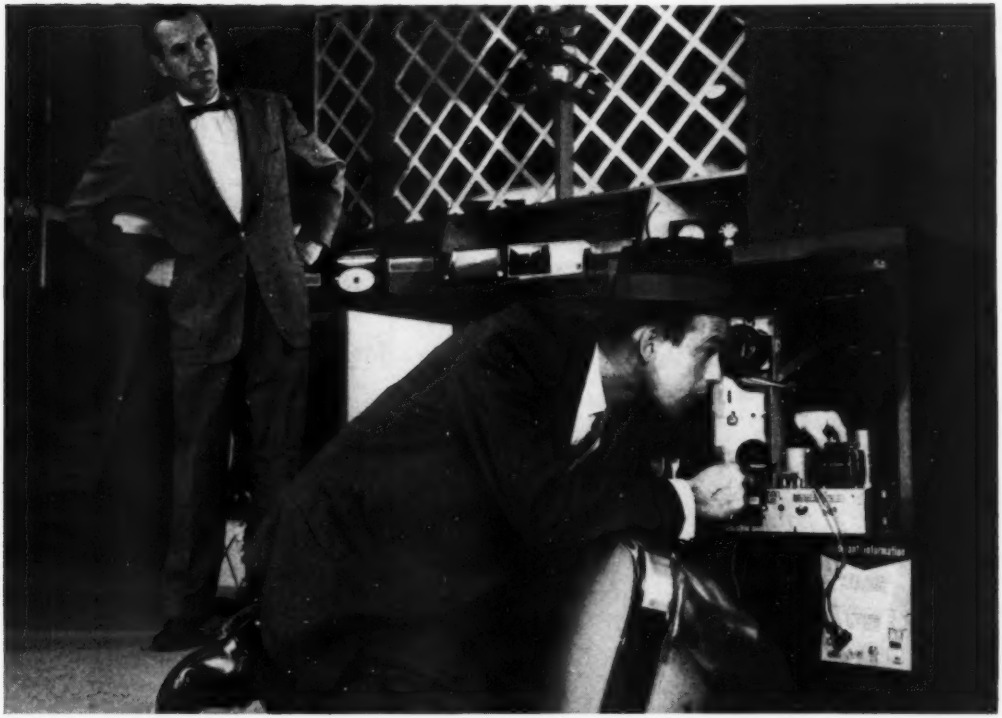
Hotpoint Co., Chicago 44, Ill.

Kelvinator Div., Amer. Motors, Detroit 32, Mich.

Westinghouse Electric Corp., Mansfield, Ohio

WATER CLOSETS, FROST PROOF

Joseph A. Vogel Co., Wilmington 99, Del.



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